PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Protect And Enhance Anadromous Fish Habitat In Grande Ronde Basin Streams

BPA project number: 8402500
Contract renewal date (mm/yyyy): 3/2000 ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Oregon Department of Fish & Wildlife

Business acronym (if appropriate) ODFW

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses
2.1, 7.6A.2, 7.6B.1, 7.6B.3, 7.6B.4, 7.6B.5, 7.6B.6, 7.6C, 7.6D, 7.7, 7.8D.1, 7.8E.1, 7.10

FWS/NMFS Biological Opinion Number(s) which this project addresses
N/A

Other planning document references
1) Grande Ronde River Subbasin- Salmon and Steelhead Production Plan, Columbia Basin System Planning, ODFW, CTUIR, NPT, WDF, WDW. 1990. 2) Grande Ronde River Basin: Salmon and Steelhead Habitat Improvement Iniatives, CTUIR, 1983. 3) Grande Ronde River Basin Fish Habitat Improvement Implementation Plan, ODFW, 1988. 4) UGR River Anadromous Fish Habitat Protection, Restoration, and Monitoring Plan, USFS, PNFRES, ODFW, CRITFC, CTUIR, NPT, OSU, 1992. 5) CTUIR - Columbia Basin Salmon Policy, 1995. 6) NMFS-Snake River Salmon Recovery Plan (8/97 draft), Chap.4, pg. 61, 1997. 7) Stream and Riparian Conditions in the Grande Ronde Basin: A Report to the G.R. Model Watershed Board, Clearwater Biostudies, 1993. 8) Grande Ronde Model Watershed Operations - Action Plan, 1994. 9) Application of the EDT Method to the G.R. Model Watershed Project, Mobrand

Biometrics, 1997. 10) MYIP for the Protection, Restoration & Enhancement of Col. River Basin F&W Resources, CBFWA, 1997.

Short description
Protect and enhance fish habitat in selected streams on private lands in the Grande Ronde Basin to improve instream and riparian habitat diversity, and increase natural production of wild salmonids.

Target species
Summer Steelhead, Spring Chinook, Redband Trout, Bull Trout

Section 2. Sorting and evaluation

Subbasin
Upper and Middle Grande Ronde River subbasins, Catherine Creek subbasin, Wallowa River subbasin, Joseph Creek subbasin, Camas Creek subbasin

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
☒ Anadromous fish ☐ Resident fish ☐ Wildlife	☒ Multi-year (milestone-based evaluation) ☒ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☒ Operation & maintenance ☐ New construction ☐ Research & monitoring ☒ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
8402100	John Day Basin Habitat	Shares funding and personnel to

	Improvement - ODFW	implement and maintain projects on Camas Creek.
9128	Upper Grande Ronde Habitat Enhancement - CTUIR	Shares funding and personnel to implement and maintain the McCoy Meadows Restoration Project and other new projects.
9402700	Grande Ronde Model Watershed Projects - GRMWP	Partially funded the proposed projects.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1998	Constructed 101 miles of riparian livestock exclosure fencing protecting 59.6 miles of stream and 1,394 acres of riparian habitat. Planted 76,195 riparian trees or shrubs, and installed 2,527 instream structures.	Many miles of stream remain to be treated.

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Restore riparian vegetation species diversity and community structure so the positive interaction of the stream, riparian zone and floodplain perpetuate and maintain normative ecological and physical processes.	a	Work cooperatively with 6 private landowners to procure long term riparian lease agreements on Meadow Creek, Hurricane Creek, Whiskey Creek (Wallowa R. tributary) and the Lostine River that protect habitat in the highest priority areas.
1		b	Analyze existing information available from: watershed assessment documents; from local district fisheries biologists; the Grande Ronde Model Watershed and others. Prioritize new projects.
1		c	Develop project plans/designs on 4

			projects, develop contract documents and obtain neccesary permits.
1		d	Conduct onsite preparation activities on 4 projects (6 landowners), prepare contracts, and obtain any permits needed to gain access and complete onsite work .
1		e	Construct 4 off-site spring developments to encourage livestock utilization of uplands and divert grazing pressure away from streams and riparian areas.
2	Improve instream habitat diversity and streambank stability by constructing biengineering treatments, instream structures and placing large wood.	a	Work cooperatively with 6 private landowners to procure long term riparian lease agreements on Meadow Creek, Hurricane Creek, Whiskey Creek (Wallowa R. tributary) and the Lostine River that protect habitat in the highest priority areas.
2		b	Survey/assess streams to identify work areas, plan work, layout and mark specific sites where bank stabilization and instream structures will be implemented.
2		c	Develop construction schedules, engineer project specifications, advertise for construction bids, select contractors and obtain permits for implementation activities.
2		d	Purchase construction materials and supplies necessary to construct planned habitat improvements.
2		e	Construct instream fish habitat and streambank stabilization structures determined during prework assessment on the Lostine River, Hurricane Creek and Meadow Creek.
3	Conduct operations and maintenance activities on all existing projects to insure maximum program benefits on all leased riparian areas.	a	Inspect and maintain 99.4 miles of riparian fence which protects 57.1 miles of stream and 1,254 acres of riparian habitat. This includes 135 livestock watering gaps and 33 off-site spring developments.

3		b	Assess revegatation success for all leased areas. Plant native trees and shrubs where needed to meet revegetation objectives.
3		c	Inspect leased areas for noxious weeds and work with county weed agencies to control listed species on 1,254 acres of leased habitat.
3		d	Inspect streambank stabilization and instream structures in 57.1 miles of stream and perform necessary maintenance. Use FEMA cost share where available.
3		e	Coordinate O & M activities with landowners to insure that project goals and landowner needs are met.
4	Monitor and evaluate Grande Ronde Basin fish habitat enhancement projects to determine if goals and objectives are being met.	a	Annually take 231 photopoint pictures established on 32 individual projects, in 22 streams. Document changes in vegetation and channel morphology attributable to habitat projects.
4		b	Continue year around monitoring of hourly stream temperatures at twelve project monitoring sites on 6 streams. Annually summarize and analyze the data collected.
4		c	Take 70 riparian habitat transects on McCoy and Elk creeks to assess stream channel and vegetative responses to habitat restoration projects.
4		d	Conduct biological surveys (spawning ground counts, fish population estimates, bird nesting, etc.) in selected study areas to determine if positive resposes of fish and wildife are realized within project areas.
4		e	Report results of M & E activities in quarterly and special reports.
5	Insure maximum communication, education, and coordiantion of habitat enhancement activities by actively pursuing opportunities to work with, educate and learn from	a	Work cooperatively with the Grande Ronde Model Watershed Program and other local watershed councils to identify and prioritize projects and activities beneficial to the

	personnel involved with other agencies, organizations, and programs.		protection and restoration of riparian areas and watersheds on private lands.
5		b	Coordinate field activities with other agencies, organizations, and programs to insure program consistency and coordination of habitat enhancement efforts.
5		c	Answer coorespondence, respond to information needs, and make presentations to other agencies, private organizations, school/youth groups and the news media.
5		d	Work cooperatively with private landowners to promote management activities that protect and restore instream and riparian habitat and watersheds on private lands. Update individual landowners on the progress of their projects.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	3/2000	11/2000			30.00%
2	6/2000	11/2000			5.00%
3	3/2000	2/2001			45.00%
4	3/2000	2/2001			10.00%
5	3/2000	2/2001			10.00%
				Total	100.00%

Schedule constraints

Catastrophic natural events such as floods, windstorms or extreme fire danger

Completion date

2015

Section 5. Budget

FY99 project budget (BPA obligated): $260,000

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	2-FTE's, 2-3 Temps, Prgm Admin.	%30	108,548
Fringe benefits	OPE @ 38% of Personnel	%11	41,248
Supplies, materials, non-expendable property	New Implementation	%5	19,000
Operations & maintenance	This includes only materials, vehicles, mileage, office supplies, tools & equipment	%9	32,408
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		%0	
NEPA costs		%0	
Construction-related support		%0	
PIT tags	# of tags:	%0	
Travel	Frequent overnight trips from La Grande to Enterprise	%2	7,656
Indirect costs	Admin. Overhead @ 35.5%, excluding capital and subcontracts	%20	74,145
Subcontractor	Fence construction and weed control	%23	83,777
Other		%0	
TOTAL BPA FY2000 BUDGET REQUEST			$366,782

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
ODFW Restoration and Enhancement Board (seeking)	Installation of instream structures	%4	17,000.00
Governors Watershed Enhancement Board (seeking)	Materials for 5 miles of riparian fencing	%5	19,000.00
		%0	
		%0	
Total project cost (including BPA portion)			$402,782

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	$325,000	$340,000	$355,000	$370,000

Section 6. References

Watershed?	Reference
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PART II - NARRATIVE

Section 7. Abstract

The ***"Grande Ronde Basin Fish Habitat Enhancement Project"*** develops and constructs riparian fencing and instream structures to protect, enhance, and restore riparian and instream habitat for anadromous salmonids to improve natural fish production. This project implements Program Measures 7.6, 7.7, 7.8 and 7.10 of the Columbia River Basin Fish and Wildlife Program. These measures call for coordinated efforts to protect and improve spawning and rearing habitat, improve fish passage, and provide offsite mitigation for mainstem fishery losses caused by the Columbia River hydroelectric system. Accomplishing this goal will partially mitigate these losses.

Initiated by the Oregon Department of Fish and Wildlife (ODFW) in 1984, this project protects habitat on private lands in selected tributaries, through long term lease agreements. Primary techniques include passive regeneration of habitat, using riparian exclosure fencing to restore streams to a normative condition. Active remediation using plantings, off-site water developments, and site-specific instream structures are also used where applicable.

Individual projects contribute to ecosystem and basin-wide watershed restoration efforts that are underway by state, federal and tribal agencies, the Grande Ronde Model Watershed Program and local watershed groups. While the focus of this project is on endangered Snake River spring/summer chinook and threatened summer steelhead, resident fishes and many species of wildlife also benefit. Long term maintenance is an ongoing and vital element of this program, and a monitoring program has been in place that includes: stream temperatures, habitat transects, physical and biological surveys, and photopoints.

In FY2000 we propose to treat 5.4 miles of stream including: 2.1 miles of the Lostine River, 1 mile of Whiskey Creek in the Wallowa Subbasin, 1.2 miles of Hurricane Creek, and 1.1 miles of Meadow Creek.

Section 8. Project description

a. Technical and/or scientific background

The Grande Ronde Basin is a major drainage located in the northeast corner of Oregon. Originating in the Blue Mountains, the Grande Ronde River flows north to the Snake River. Approximately 45% of the lands are under federal ownership. Historic land uses include timber harvest, grazing, agriculture and recreation.

The Grande Ronde drainage historically supported large runs of summer steelhead. Historic run sizes are unknown, but 15,900 to the mouth of the Grande Ronde was estimated for 1963 prior to the construction of Snake River dams (COE 1975). Spawning ground counts conducted annually on the Grande Ronde River and tributaries since 1964 indicate that summer steelhead have declined dramatically since the 1970s and early 1980s despite reductions in harvest. The decline has been attributed to mortality at Columbia and Snake River dams and habitat degradation (ODFW and CTUIR 1990). Major problems limiting production within the Grande Ronde Basin

include degraded riparian habitat, lack of rearing habitat and inadequate screening at water diversions (CTUIR 1983).

The Grande Ronde Basin also supported large runs of native Spring chinook salmon. Fisheries managers estimated that 12,200 spring chinook salmon escaped to the mouth of the Grande Ronde River in 1957 (COE 1975). Redd counts have been conducted by the ODFW and tribes since the late 1940's. These counts indicate that the basin supported large runs until the 1970's. Despite large reductions in harvest, redd counts have shown a declining trend through time (ODFW and CTUIR 1990). Within the basin, riparian and instream habitat degradation has most severely impacted spring chinook production potential (ODFW and CTUIR 1990).

Both summer steelhead and spring chinook salmon in the Grande Ronde Basin are listed on the federal endangered species list. Spring chinook are listed as endangered and summer steelhead are listed as threatened.

The negative influences to salmonids from logging, grazing, dams, irrigation withdrawals, urbanization, exotic species introductions and other human activities have been documented in all of the Columbia River tributaries (ISG 1996), and several restoration plans have been written to address identified problems (CBFWA 1997). Timber harvest and cattle grazing are common land management practices in the basin. Logging and associated road building in riparian and floodplain forests eliminates sources of large wood, reduces shade and bank stability, and increases erosion (Maser 1988; Meehan 1991). Overgrazing by domestic livestock can change riparian and stream channel characteristics to the detriment of salmonids (Bauer and Burton 1993; Kauffman and Krueger 1984; Platts 1990; Lichatowich and Mobrand 1995; Wissmar et al. 1994).

With the exception of roadless or wilderness areas, habitat degradation within the Grande Ronde Basin has been widespread (Anderson et al. 1992; CTUIR 1983; Henjum et al.1994; McIntosh et al. 1994; Wissmar et al. 1994). Degraded stream habitat conditions were identified in 273 miles of streams on private lands within the Upper Grande Ronde, Joseph Creek and Wallowa subbasins (CTUIR 1983). In the Upper Grande Ronde subbasin alone 80% of the anadromous fish habitat was considered to be in degraded condition (Anderson et al. 1992), and about 70% of large pool habitat lost since 1941 (McIntosh et al. 1994). The Oregon Department of Environmental Quality has listed approximately 62 streams/segments on the state's list of water quality limited water bodies (303 (d) list). Of these streams/segments 24 are listed for habitat modification, 27 for sediment and 49 for temperature.

The eventual ESA listings of Snake River sockeye in 1991 and spring/summer chinook in 1992 led to increased efforts to implement ecosystem based or "ridge top to ridge top" approaches to species recovery within individual subbasins (Anderson et al. 1992; CBFWA 1997; Huntington 1993; Mobrand and Lestelle 1997; NMFS 1997; Wallowa Co.-Nez Perce 1993), and the Grande Ronde was designated as a "model watershed" in early 1990's. Initiated in 1984, the "*Grande Ronde Basin Fish Habitat Enhancement Project"* is a logical and integral part of the species recovery process by implementing and maintaining projects that establish long term riparian and instream habitat protection and enhancement, and tributary passage improvement on private lands through riparian lease agreements. It fits well within the conceptual foundation or framework proposed by the Independent Scientific Group and the Fish and Wildlife Managers (ISSG 1996; CBFWA 1997).

The intent of the *"Grande Ronde Basin Fish Habitat Enhancement Project"* is to provide offsite mitigation for mainstem losses of habitat and fish productivity caused by the construction and operation of eight dams on the Columbia River, and is to be achieved through coordinated efforts to protect and improve spawning and rearing habitat, and improve fish passage (NPPC 1994). The project mitigates for mainstem losses by improving production of spring chinook salmon and summer steelhead returning to the Grande Ronde subbasin.

The ODFW conducted a watershed assessment and developed a plan for the implementation of fish habitat projects in the Grande Ronde Basin (Noll et al. 1988). The development of this plan involved a comprehensive habitat survey of known anadromous fish production streams. From these surveys and existing information on habitat conditions, habitat limiting factors were developed. The surveys were used as the basis for determining where habitat improvement work was needed. A prioritized list of streams needing habitat improvement was created based on habitat condition (those areas most likely to recover in a cost effective manner), fish use, fish species present, and logistical constraints (accessibility, technical feasibility, landowner acceptance, etc.).

Since the development of ODFW's plan for implementing habitat improvements in 1988 other assessments of basin habitat conditions and plans for restoration have been developed including the Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and monitoring Plan, and the Application of the Ecosystem Diagnosis and Treatment Method to the Grande Ronde Model Watershed Project. The Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan set desired future conditions or standards in the Upper GR for Floodplain/Riparian Vegetation, Channel Morphology, Sediment/Substrate, and Water Quality/Quantity and also established management guidelines to achieve the DFC's. The Application of the Ecosystem Diagnosis and Treatment Method to the Grande Ronde Model Watershed Project (Established "patient" (current) versus "template" (historic) environmental attributes for temp, sediment, habitat diversity, etc. These assessments/reviews have supported the approach of riparian restoration as a primary tool of improving habitat to restore runs of summer steelhead and spring chinook salmon in the Grande Ronde Basin.

Potential new project areas, by subbasin, are prioritized using an adaptive management approach that includes: 1) field review of projects completed in the basin by ODFW and others; 2) review of more recent watershed assessments or habitat surveys; 3) and continued input from local fisheries biologists. Individual projects of the Grande Ronde Fish Enhancement project are also reviewed by Grande Ronde Model Watershed Program Technical Review group. Projects are rated based on six biological and six social/economic/technical criteria. The implementation portion of four recent projects (on the Grande Ronde River, Beaver Creek, Meadow Creek and Hurricane Creek) was funded through the GRMWP].

The primary approach of this project is to address the impacts to riparian vegetation communities and fisheries habitat caused by the inappropriate management of domestic livestock. The preferred method of addressing this problem is by excluding domestic livestock from riparian zones by constructing exclosure fences. Other types of fish habitat improvements such as instream structures and large wood debris (LWD) placement are implemented before grazing problems are addressed if such problems exist on a treatment reach. Because the riparian zone is the primary control of biotic factors within the stream environment, there is an inseparable link between them (Cummins et al. 1984). The negative effects of livestock grazing on the structure and function of riparian communities and aquatic habitats is well documented (Elmore and Beschta 1987; Meehan and Platts 1978; Platts 1991; Chaney et al. 1993). The most widespread factor affecting riparian communities and fish habitat in northeastern Oregon is the inappropriate

management of grazing livestock. Passive regeneration techniques using riparian exclosure fencing to exclude livestock from riparian zones is the primary method used to restore degraded habitat, and has proven to be an effective means of improving riverine/riparian habitats along grazed streams (Chaney et al. 1993; Platts 1990; NMFS 1997). In a field review of BPA projects Beschta et al. (1991) stated that "Corridor fencing resulted in the most successful examples observed of vegetation recovery, diversity of channel morphology, and improved fish and wildlife habitat." Active remediation techniques using plantings (Chaney et al. 1993; ISG 1996), bioengineered, or other instream structures may also improve habitat, and may be required when natural processes are dysfunctional or unlikely to result in recovery within a desired time frame (Huntington 1994; NMFS 1997; Roper et al. 1998).

Riparian corridor fencing to exclude livestock accomplishes both protection and enhancement of riparian communities. Fencing provides the tool for natural vegetation restoration, and protects the riparian zone from further impacts from livestock. Protection of habitat is by far the most productive method of maintaining quality fish habitat (Reeves et al. 1991).

Site specific instream structures and/or LWD placements are installed as a secondary treatment approach where instream habitat diversity is a limiting factor. Our intent is to provide needed instream cover in treatment reaches lacking such in order to provide some immediate instream benefit. Riparian recovery will eventually perpetuate the habitat characteristic for which the naturally functioning stream is capable. Roper et al. (1998) supports this approach of treating instream needs as a secondary treatment while riparian and watershed problems are being addressed.

It is well documented that large wood debris is a key component of quality fish habitat (Bisson et al. 1987), greatly influences the structure and function of stream ecosystems (Sedell et al. 1988; Bilby and Likens 1980), and greatly influences stream channel form and fluvial processes (Keller and Swanson 1979).

Scientific literature supports the carefully evaluated installation of instream structures (Roper et al. 1998). The addition of structures or large boulders to create pools or cover can increase fish populations in cases where these attributes are lacking (Bjornn and Reiser 1991). House and Boehne (1985) found that the installation of instream structures into the altered habitats of the East Fork of Lobster Creek, Oregon led to increased spawning and rearing use by coho salmon and steelhead at the improvement sites. Solazzi et al. (1992) found that instream habitat improvements including the installation of channel spanning log structures to create pools and alcoves led to a significant increase in overwinter survival of coho salmon in Lobster Creek, Oregon. Reeves et al (1996) observed an apparent increase in 1+ age steelhead (although not statistically significant) in Fish Creek, Oregon, after the installation of instream structures. Two one hundred-year storm events hit the watershed in 1995 and 1996 that led to the loss of 50% of the structures installed. However, post event surveys indicated that overall changes in habitat types were moderate. The authors suggested that the instream structures played a role in maintaining the habitat.

Reeves et al. (1991) provides an overview of management evaluations of several habitat modification projects in the Midwestern and eastern North America by measurements of trout abundance as adapted from White (1975). Of the 11 studies summarized, 10 showed increased abundance/biomass of trout ranging from 10-15% to 400-500%.

Preproject evaluation are made to determine if instream structure placement is appropriate, and if so, what the most appropriate treatment types are. The Rosgen (1996) assessment process for

determining the stable channel form of a subject stream is used. This assessment process includes comparing a series of measurements between an unstable treatment stream and a stream reach of similar classification in a stable condition. The author indicates that the use of such an assessment process, and implementation based on the assessment results, will lead to a high success rate of applying improvements for fish enhancement. Altering the natural stable channel forms through the installation of fish habitat improvements or the installation of these improvements into unnaturally unstable stream channels is inappropriate.

After fifteen years of intensive effort by this project a total of 57 miles of stream have been treated, benefiting endangered Snake River spring chinook, summer steelhead, and residents fishes and wildlife. However, much work is yet to be done. With continued funding we anticipate protecting and enhancing an average of 5 miles of stream/year, and providing continued protection, maintenance, and monitoring of 30 existing projects.

b. Rationale and significance to Regional Programs

Habitat degradation, caused by overgrazing, road construction, timber harvest and other management activities has adversely affected instream and riparian areas and their effective hydrologic function. Low summer stream flows, high summer water temperatures, poor bank stability, winter icing, sedimentation, and a lack of instream and riparian habitat diversity has occurred, affecting salmonids throughout much of the Grande Ronde basin (Noll et al 1988). Degraded stream habitat conditions were identified in 273 miles of streams on private lands within the Upper Grande Ronde, Joseph Creek and Wallowa subbasins (CTUIR, 1983). In the Upper Grande Ronde subbasin alone 80% of the anadromous fish habitat is considered to be in degraded condition (Anderson et al., 1992), and about 70% of large pool habitat lost since 1941 (McIntosh et al. 1994).

This project establishes long term riparian, fish habitat and tributary passage improvements on private lands through riparian leases, cooperative agreements and easements of 15 years in length. Individual projects contribute to ecosystem and basin wide watershed restoration and management efforts underway by state, federal and tribal agencies. The project provides off-site mitigation for mainstem fisheries losses caused by Columbia River hydroelectric dams. The project goal is to rehabilitate and improve Fish and Wildife Program (FWP, NPPC 1994). This project is an integral part of meeting biological objectives for spring chinook and summer steelhead in the Grande Ronde subbasin. Planning for project implementation is coordinated on a comprehensive watershed basis that includes the participation of private landowners, state and federal agencies, tribes and watershed councils as called for in measure 7.6 and 7.7 of the 1994 FWP. Individual projects also incorporate “Best Management Practices” as outlined in measure 7.8B of the FWP; riparian easements with private landowners as specified in Program Measure 7.8E; and fish passage is established or improved as outlined in measure 7.10 of the FWP. Restoration of riparian vegetation to restore normative ecological processes clearly supports the Fish and Wildlife Program goal of a healthy Columbia Basin. Through our iterative process of reevaluating our success/approach, we are maximizing the potential of the program meeting this goal. Playing a significant role in meeting biological objectives for the Grande Ronde subbasin, these projects contribute to the Northwest Power Planning anadromous fish spawning and rearing habitat as outlined in program measure 7.6 of the Council’s interim goal of doubling anadromous fish runs in the Columbia River Basin by providing offsite mitigation for mainstem fisheries losses caused by the eight dams along the Columbia River hydroelectric system. The biological objectives for these species in the Grande Ronde are 16,000 annually returning spring chinook and 27,000 summer steelhead (ODFW and CTUIR 1990).

Habitat improvements implemented under this program will result in the following benefits: 1) increased water table saturation zones and in-stream flow levels during summer months, 2) slower water velocities and narrower stream channels, 3) more diverse riparian vegetation communities to stabilize streambanks, 4) provide recruitable wood for instream cover, 5) increase shading, 6) increase insect drop and 7) filter sediments. These combined benefits will aid anadromous salmonids by improving overall water quality, increasing and diversifying fisheries habitat and increasing potential food sources.

This habitat restoration project is a necessary measure to accomplish natural production goals as outlined in the Grande Ronde Subbasin Salmon and Steelhead Production Plan. Failure to meet biological objectives in the Grande Ronde subbasin will impact the Northwest Power Planning Council in realizing its interim goal of doubling anadromous fish runs in the Columbia River basin by providing offsite mitigation for mainstem fisheries losses caused by the dams that constitute the Columbia River hydroelectric system.

Additionally, failure to fund maintenance of existing projects will lead to significant losses in recovery gained. This would occur mainly through livestock entering exclosure fences that are not maintained. Without maintenance cattle will enter these exclosures and rapidly destroy riparian vegetation that has been restored over the past 12 years. Accomplishment of maintenance activities by landowners would be variable.

After fifteen years of intensive efforts by this project a total of 57 miles of stream have been treated, benefiting endangered Snake River spring chinook, summer steelhead, residents fishes and wildlife. However, much work is yet to be done. With continued funding we anticipate protecting and enhancing an average of 5 miles of stream/year in 2000 and beyond, and providing continued protection, maintenance, and monitoring of 30 existing projects.

c. Relationships to other projects

In Eastern Oregon the Grande Ronde Habitat Enhancement project (8402500), the Mainstem, Middle Fork, and North Fork John Day River project (8402100), the Umatilla Habitat Improvement project (871002), the Fifteen Mile Creek Habitat Improvement project (9304000), and the Trout Creek project (9404200) are closely tied. These projects use similar methods, focusing on watershed health and riparian and instream habitat enhancement within anadromous fish streams as a means of protecting and improving the quantity and quality of salmonid spawning and rearing habitat. The Grande Ronde, John Day, and Umatilla habitat projects communicate on a frequent basis, and regularly share equipment, funding, technology and personnel. For example, individual projects in the Camas Creek drainage (North Fork John Day subbasin) are funded under the John Day program, but implemented and maintained by Grande Ronde project personnel due to their geographic location. Grande Ronde and John Day personnel assisted the Umatilla project in 1996 with bioengineered treatments, receiving valuable training on use of "soft" structural applications in the process.

Specifically within the Grande Ronde River Basin there are several FWP funded projects that complement this project. Examples include:

- The Upper Grande Ronde Habitat Enhancement project (9128) sponsored by the CTUIR has been working cooperatively with ODFW, other agencies and a private landowner on the McCoy Meadows Restoration Project in which funds (from BPA, ODEQ, and EPA) and

personnel are being shared. Beginning in 1988 this project has been under a 15 year riparian fencing and lease agreement through this project. Since then, an interagency group, led by the CTUIR has taken the project a step further in the restoration process. In phase I, completed in 1997, a channelized reach of stream was relocated into one of its historic meanders to improve overall floodplain function, and riparian fencing was relocated several hundred feet away from the stream to protect the entire wetland and much of the surrounding uplands. Additional phases in 1998-99 include removing an existing culvert/bridge that constricts stream flow, relocating additional portions of McCoy Creek into historic meanders in the lower reaches, and doing similar work in nearby Meadow Creek where an abandoned railroad grade presently constricts flows.

- Individual projects of the Grande Ronde Fish Enhancement project are reviewed/rated by GRMWP Technical Review group, and the implementation portion of several projects have been funded through the GRMWP. The GRMWP fulfills the larger role of overall watershed assessment, relates watershed issues to local cultures and economies, and funds more general watershed/fisheries projects. The Grande Ronde habitat project is able to more specifically address instream fish and riparian habitat issues, and because of ODFW's well established long term relationships with individual landowners we are often able to work much closer with landowners who shy away from multi-agency groups or "big government". We are also able ensure long term commitments are met, conduct more thorough monitoring and maintenance of selected projects, and remain more focused on protecting the highest priority streams. This project is consistent with the goals identified in the Grande Ronde Model Watershed Operations - Action Plan (GRMWP 1994), and we believe the two projects complement each other very well.

- The Spring Chinook Salmon Early Life History project (9202604) helps identify critical habitat locations and specific spawning, rearing, and overwinter requirements of spring chinook salmon. The results of that work aid this project by providing data that is useful in prescribing treatments in a given stream reach, and connects research efforts to on the ground projects. Equipment is occasionally shared between these projects as well.

- The Oregon Screens project (9306600) sponsored by ODFW installs fish screens to protect migrating salmonids within the Grande Ronde and other basins. This project occasionally shares personnel and equipment with the fish screens project, and information is frequently exchanged on specific areas of where to focus work, and locations of willing landowners.

On a broader scale, there are several agencies or programs that this project collaborates with. In addition to the projects listed above, the USDA Forest Service, Wallowa-Whitman National Forest, along with the Bureau of Land Management, Baker District have many non-FWP funded habitat policies and programs (such as PACFISH) on federal lands within the basin.

The ODFW Fish Restoration and Enhancement Program has funded several riparian and instream enhancement cooperative projects in the region, focusing primarily on resident native fishes. The R&E program utilizes many of the techniques (i.e. leases, cooperative agreements, fence specifications, etc.) we have developed over the years from this project, and occasionally shares facilities and equipment to accomplish similar goals.

The Army Corps of Engineers "Modification of Corps Projects for the Benefit of the Environment" program under Section 1135 Authority is working on projects within the basin to restore or improve riparian and floodplain functions for the benefit of fish and wildlife. Personnel from this project have been actively involved with the design and implementation of these Corps

projects. The Environmental Protection Agency and Oregon Department of Environmental Quality also contribute funding from various sources that address state or federal water quality standards in this basin. In addition, the COE and the Oregon Division of State Lands (ODSL) enforce the fill/removal laws in the waters of the state; project personnel must be knowledgeable of these regulations and fill out necessary permits to complete projects involving instream work.

Other more generally related programs or agencies include: 1) the Columbia River Fisheries Development Program (Mitchell Act) which provides funding to the Oregon Screens Program to protect upstream and downstream migrants; 2) Ongoing interagency cooperation occurs between this project and local watershed councils, Soil & Water Conservation Districts, the Natural Resource Conservation Service, Oregon Department of Forestry, Oregon Department of Transportation, and other organizations or groups.

d. **Project history** (for ongoing projects)

The Grande Ronde Habitat Enhancement Project (8402500) was initiated in 1984 and is comprised of numerous smaller projects throughout the Grande Ronde Basin. Individual projects are all on private lands, and have been implemented only in cases where long term riparian lease or cooperative agreements were signed with landowners. The ODFW became the primary agency for implementing these projects on private lands because of its local fisheries expertise, its successful dealings with landowners in the basin, and its ability to provide long term maintenance and monitoring. Individual projects were originally selected and prioritized based on the *"Summary Report: Salmon and Steelhead Habitat Improvement Initiatives"* by the CTUIR and other agencies, which identified 273 miles of degraded habitat (CTUIR, 1983). In 1996 potential new project areas, by subbasin, were re-prioritized based on several factors, including: 1) review of work completed in the basin; 2) review of more recent watershed assessments such as those produced through funding from the Grande Ronde Model Watershed Program (Huntington, 1993) or local watershed groups (Wallowa County-Nez Perce Tribe, 1993); 3) input from ODFW local District Fisheries Biologists.

Past Costs and Cost Sharing: This project has been in existence since 1984 (15 years). Project budgets have averaged $270,000 and ranged from a high of $474,000 in 1992, to a low of $160,000 in 1996 -- the only year in which no new implementation occurred. Prior to 1994 the program was 100% funded by BPA. Since then, this project has supplemented Program funds with $396,000 of outside funds (using Governor's Watershed Enhancement Board, Grande Ronde Model Watershed, Federal Emergency Management Act, ODFW Fish Restoration & Enhancement and private landowner funds). Beginning in 1996 our BPA contracts have provided for cost shares with private landowners on lower priority streams, whereby the landowners provide the construction and long term maintenance of these projects. In 1997 FEMA awarded this project $148,000 to repair damages to projects from the January 1997 flood event.

Major Results Achieved: Project achievements to date include signed lease agreements with 30 different landowners, which protects 59.6 miles of streams and 1,394 acres of riparian habitat in the Grande Ronde subbasin. An additional 2.8 miles of stream and 16 acres are protected in the Camas Creek drainage, and is coordinated with the John Day Basin Fish Habitat Enhancement Project (Project No. 8402100). One hundred one miles of riparian fence have been constructed and maintained, along with 135 livestock water gaps, and 32 off-site water developments that encourage utilization of upland forage by cattle and reduce stream habitat degradation. Natural

re-establishment of riparian vegetation and improved connectivity of the channel to the floodplain has occurred in all of these projects.

We have objectively assessed each existing project based on their progress toward meeting our riparian restoration objective. This assessment is based on monitoring results and professional judgement of the Fish Habitat Biologist. We have defined riparian restoration objective as restoring riparian vegetation species diversity and community structure so the positive interaction of the stream, riparian zone and floodplain perpetuate and maintain normative ecological and physical processes. The following categories were used for classifying projects: met objective, improvement towards objective, static, or degrading. Of the 31existing projects, one has met the objective, 23 are improving, two are static, none are degrading and five are new projects. We believe this validates our approach and documents that significant riparian habitat recovery is taking place.

Approximately 2,100 site-specific instream habitat or fish passage improvement structures have been installed to address factors limiting salmonid production. Instream structures include simple structures such as single boulders or pieces of large wood, or more complicated methods including weirs or bioengineered structures, all of which are designed to address specific limiting factors (lack of pools or woody debris, sedimentation). Plantings include 76,645 riparian trees and shrubs planted in severely degraded areas, or used in bioengineered structures where recovery of native vegetation has not occurred at an acceptable rate. Regular maintenance, monitoring and evaluation are conducted as part of this program (see Section 7e. below).

The Grande Ronde Habitat Enhancement project has benefited wild Snake River spring/summer chinook and summer steelhead, bull trout and other resident fishes and wildlife by providing increased habitat diversity, streamside shading, instream cover, and canopy. Since initiation of the project, floodplain function and channel morphology and complexity have improved. For example, physical habitat surveys conducted on McCoy Creek in 1992 and 1996 showed a reduction in actively eroding streambanks from 81.3% to 36.7%, an increase of undercut banks from 0.7% to 1.5%, a decrease in percent open sky from 100% to 90%, a reduction in fines (sand, silt and organics) from 30% to 24%, and slight increases in wood volume from 0.1 to 0.3 pieces per 100 m (ODFW 1992 and 1996). Bank erosion and sedimentation have been significantly reduced, and the occurrence of fill/removal law violations by landowners applying quick fixes (rip rap, car bodies, etc.) following flood events has been significantly curtailed. In a field review of BPA projects Beschta et al. (1991) stated that **"Corridor fencing resulted in the most successful examples observed of vegetation recovery, diversity of channel morphology, and improved fish and wildlife habitat."**

Monitoring: Monitoring that has been accomplished so far has documented these and other improvements. Examples include: 1) an increase in Rb/St composition in McCoy Creek from 5.5% in 1988 to 21.6% in 1997 (McGowan 1997); 2) increases in adult steelhead returning to Whiskey Creek (McGowan and Powell 1997), 3) increased streamside shade (a 10% increase on Elk Creek, and 7% on Chesnimnus Creek in transect study areas between 1988-94); 4) reduced or stabilized stream temperatures (mean summer temperatures are 3.8 degrees C cooler at the downstream end of the project on Salmon Creek); 5) narrowing and deepening of stream channel, improved bank stability, and increased diversity of riparian vegetation and channel complexity (unpublished riparian habitat transect data, and project photopoints).

The results of this data have been used to educate landowners, tribes, other agencies and the general public, and in the application of adaptive management on projects.

Adaptive Management Implications: From the onset of this program we have worked under the assumption that enhancing instream and riparian habitat conditions will result in improved water quality and quantity, and lead to an increase in carrying capacity of salmonids within the basin. A few examples of knowledge gained over the years that influence our approach to stream restoration are:

- Upon initiation of the project in 1984 a variety of riparian enhancement strategies were considered. These included less restrictive lease terms, intensive pasture management, or intensive planting and/or use of instream structures. These techniques have been used by others but are often ineffective, or take much longer to produce recovery. Some agencies such as the Army Corps and NRCS typically require no monitoring of projects they fund or permit (NMFS, 1997). Based on our experience over the last fourteen years it seems clear that on Eastern Oregon streams riparian corridor fences, along with some limited planting or instream work will achieve the quickest recovery. The FWP calls for recovery of streams within 5 years, if possible (NPPC, 1994). In many cases this strategy fits best with the management most commonly used by cattle operators (Chaney et al., 1992). Since the listed or proposed stocks have reached critically low populations, using the most rapid method of recovery with a moderate level of maintenance and monitoring is essential.
- Our experience has also shown that different streams have different rates of recovery; many factors such as stream order, location of the stream, climate, condition of the upper watershed, and past management influence how quickly streams respond. For example, high elevation sites typically require much longer recovery periods than lower elevation areas because of extreme climate changes and shorter growing seasons. In nearly all cases there are no quick fixes to stream recovery.
- The use of active remediation techniques such as planting or use of instream structures alone at improving habitat is variable. In planning habitat improvement projects we have focused primarily on achieving proper floodplain function and establishing natural succession of riparian plant communities. Plantings and instream structures are installed on a case by case basis where they address specific limiting factors, or may be used in dysfunctional systems where proper floodplain function cannot be achieved (i.e. streams next to roads, residences, etc.). We believe that in most situations using riparian fencing alone, or combined with planting and/or bioengineering techniques using native materials, we can achieve better results than using traditional “hard” structure techniques such as rip rap, weirs, rock jetties, or barbs.
- We have used a wide variety of bioengineering and planting techniques since the program was initiated in 1984. For example, local and distant plant stocks, native and exotic plants, cuttings and rooted stocks, and use of root hormones have all been tried. Bioengineering and riparian planting success is largely dependent on donor plant selection and/or brood source, and our experience has shown that local indigenous stocks are most likely to succeed. Success is also increased when individual plants are placed in areas where these species occur naturally, therefore site selection is critical.
- As originally designed, riparian fences were thought to be relatively “maintenance free”. Our experience has shown that a successful program is dependent on a project design that includes a consideration of geomorphology and hydrology of the stream (i.e. place the fence outside of the flood prone area), and a modest yet continuous level of maintenance. Both are vital to the overall success of the program. When making selections of individual projects, willingness of a landowner to fence greater distances away from flood prone areas weighs heavily in our decision of whether or not to implement a project.

Reporting: Results such as those listed above are reported regularly in quarterly, annual, or special reports and distributed to respective ODFW districts, BPA and other interested parties.

e. Proposal objectives

The overall goal of the Grande Ronde Basin Fish Habitat Enhancement Project is to increase natural production of wild anadromous salmonid populations by addressing the causes of habitat degradation. Expected benefits are reduced sediment loading, improved water quality and quantity, and improved riparian habitat and instream habitat diversity in treated streams. This project will: plan and implement a limited number of new projects; continue to maintain long term investments on existing projects; continue to monitor and evaluate these projects to determine their effectiveness; coordinate efforts and utilize a watershed approach to restoration in the basin; and administer the project to insure maximum program benefits. Specific objectives and tasks associated with this work are identified as follows:

Objective 1: Restore riparian vegetation species diversity and community structure so the positive interaction of the stream, riparian zone and floodplain perpetuate and maintain normative ecological and physical processes.

Task 1a: Work cooperatively with 6 private landowners to procure long term riparian lease agreements on Meadow Creek, Hurricane Creek, Whiskey Creek (Wallowa R. tributary) and the Lostine River that protect habitat in the highest priority areas.

Task 1b: Analyze existing information available from: watershed assessment documents; from local district fisheries biologists; the Grande Ronde Model Watershed and others. Prioritize new projects.

Task 1c: Conduct onsite preparation activities on 4 projects (six landonwers), prepare contracts, and obtain any permits needed to gain access and complete onsite work.

Task 1d: Construct 12 miles of livestock exclosure fences and associated stream crossings on streams impacted by grazing including: 2.1 miles of the Lostine River, 1 mile of Whiskey Creek in the Wallowa Subbasin, 1.2 miles of Hurricane Creek and 1.1 miles of Meadow Creek.

Task 1e: Construct 4 off-site spring developments to encourage livestock utilization of uplands and divert grazing pressure away from the streams and riparian areas.

Objective 2: Improve instream habitat diversity and streambank stability by constructing biengineering treatments, instream structures and placing large wood.

Task 2a: Work cooperatively with 6 private landowners to procure long term riparian lease agreements on Meadow Creek, Hurricane Creek, Whiskey Creek (Wallowa R. tributary) and the Lostine River that protect habitat in the highest priority areas.

Task 2b: Survey/assess streams to identify work areas, plan work, layout and mark specific sites where bank stabilization and instream structures will be implemented.

Task 2c: Develop construction schedules, engineer project specifications, advertise for construction bids, select contractors and obtain permits for implementation activities.

Task 2d: Purchase construction materials and supplies necessary to construct planned habitat improvements.

Task 2e: Construct instream fish habitat and streambank stabilization structures determined during prework assessment on the Lostine River, Hurricane Creek and Meadow Creek.

Objective 3: Insure maximum program benefits within leased areas by conducting operations and maintenance activities on all existing riparian exclosure fences, plantings and instream structures. These activities are conducted year around.

Task 3a: Inspect and maintain 101 miles of riparian fence which currently protects 59.6 miles of stream and 1,394 acres of riparian habitat. This includes 135 livestock watering gaps and 33 off-site spring developments.

Task 3b: Inspect all leased areas for revegetation success. Plant native trees and shrubs (such as willow & cottonwood cuttings, conifers) where needed to reduce bank erosion, and to improve degraded overstory & understory components of riparian plant communities.

Task 3c: Inspect all leased areas for noxious weeds and work with county weed agencies to control listed species on 1,254 acres of leased habitat.

Task 3d: Inspect streambank stability and instream structures in 59.6 miles of stream and perform necessary maintenance on a case by case basis. Cost share these activities at 3:1 using FEMA funds when available or applicable.

Task 3e: Coordinate the above O&M activities with 30 landowners to insure project goals and landowner needs are both met, and with minimal disturbance to landowner operations.

Objective 4: Monitor and evaluate Grande Ronde Basin fish habitat enhancement projects to determine if project goals and objectives are being met. Prepare reports of the results, and apply adaptive management based the information gathered.

Task 4a: Annually retake 231 photopoint pictures established on 32 individual projects, in 22 streams. Document changes in vegetation and channel morphology attributable to habitat projects.

Task 4b: Continue year around monitoring of hourly stream temperatures at twelve project sites, on 6 streams. Annually summarize and analyze the results of data collected from ten permanent thermographs.

Task 4c: Retake 70 riparian habitat transects on McCoy and Elk creeks to assess stream channel and vegetative responses to habitat restoration projects.

Task 4d: Conduct biological surveys (spawning ground counts, fish population estimates, bird nesting) in selected study areas to determine if improvements in habitat result in increases in fish/wildlife populations.

Task 4e: Report the results of all project M&E activities in quarterly, annual and special reports. Distribute to ODFW fish districts, BPA, and other interested parties, and identify adaptive management implications.

Objective 5: Insure maximum communication, education and coordination of habitat enhancement activities by actively pursuing opportunities to work with, educate and learn from personnel involved with other agencies, organizations, and programs.

Task 5a: Work cooperatively with the Grande Ronde Model Watershed Program and other local watershed councils to identify and prioritize projects and activities beneficial to the protection and restoration of riparian areas and watersheds on private lands.

Task 5b: Coordinate field activities with other agencies, organizations, and programs to insure maximum technology transfer, program consistency and coordination of habitat enhancement efforts.

Task 5c: Answer correspondence, respond to information needs, and make presentations to other agencies, private organizations, school/youth groups and the news media.

Task 5d: Work cooperatively with private landowners to promote management activities that protect and restore instream and riparian habitat and watersheds on private lands. Update individual landowners of the progress of their projects using the information gathered in Objective 4 above.

The following administrative activities are inherent within each of the above project objectives.

- Coordinate project activities with ODFW fiscal, realty, regional and district staff; with the BPA contracting officer, and NPPC staff to insure that program operations are consistent with ODFW and BPA policies.
- Maintain habitat program databases, records and files.
- Hire, train and supervise the activities of project technicians.
- Prepare annual work statements and budgets; write quarterly, annual and other reports; write and administer contracts; and purchase necessary equipment, materials and supplies.
- Pursue cost share opportunities with other programs and agencies (model watershed, GWEB, ODFW Fish Restoration & Enhancement, FEMA, etc.) and private landowners. Track and administer additional funding.

f. Methods

The overall program objective is to increase natural production of wild anadromous salmonids by removing the causes of habitat degradation. Reducing sediment loading, improving water quality and quantity, and improving riparian habitat and instream habitat diversity are expected benefits.

Scope: This project addresses habitat degradation in the Grande Ronde subbasin by: 1) implementing new projects through lease agreements with private landowners on selected streams; 2) maintaining project investments over the terms of the lease; 3) monitoring and evaluating the projects and applying adaptive management; 4) coordinating with other agencies, Tribes, organizations and school/youth groups.

Underlying Assumptions: Overgrazing of riparian areas, timber harvest, road construction along streams and other management practices have led to habitat degradation in the basin. Encouraging recovery of riparian vegetation, improving streambank stability and instream habitat diversity will result in an overall increase in water quality and quantity within the Grande Ronde subbasin. By addressing the freshwater stages of the salmonid life cycle and allowing natural processes to occur, improvements in habitat will result in an increase in salmonid carrying capacity within the basin.

Selection of projects for implementation is based on six rationale (three biological in nature and three logistical or administrative in nature). The biological rationale include presence of the target species, benefits to fish, and project orientation. For the species of interest (or target species) the potential project site will be considered based on the life history phase use by the target species and the limiting factors that could potentially be addressed. Projects addressing habitat needs of both target species and other species of indigenous species are given highest priority. Project orientation relates to the project's position in the watershed. Resolution of habitat problems should begin in the headwaters and proceed downstream. Projects higher in the watershed will be given higher priority. Consideration will also be given to the proximity to existing habitat enhancement projects. Administrative and logistical rationale includes cost effectiveness, landowner acceptance and cooperation, and logistic constraints. The program strategy is to implement activities that provide the most immediate and long lasting benefits to fish production capability, and to do so in the most cost effective manner possible. Landowner acceptance and cooperation are necessary on private lands where these projects are implemented. Failure to gain landowner acceptance precludes the development of a project. Logistical constraints may include equipment access, timing as it relates to landowner landuse practices, chinook and/or steelhead spawning incubation periods and technical feasibility.

Planning for implementation of these projects includes the participation and involvement of private landowners, state and federal agencies, tribes, model watersheds, and watershed councils. Individual projects contribute to ecosystem and basin-wide watershed restoration and management efforts that are underway by these groups. Emphasis is placed on restoring natural re-development of habitat diversity, the importance of channel to floodplain connectivity and seasonal flooding in creating and maintaining habitat, and eliminating the sources of habitat degradation (ISG, 1996).

Specific Projects:

Specific treatment reaches include 2.1 miles of the Lostine River, 1 mile of Whiskey Creek in the Wallowa Subbasin, 1.2 miles of Hurricane Creek, and 1.1 miles of Meadow Creek.

Limiting factors to be addressed along the Lostine River include: unstable streambanks in excess of normal, poor instream habitat conditions, poor riparian vegetation and low summer flows. We propose to address these limiting factors by constructing riparian exclosure fencing to exclude livestock from the riparian area, planting native vegetation where necessary, and installation of site specific instream structures. A preliminary assessment of the project reach has been made. The actual need and proposed installation of riparian plantings will be determined by a more thorough assessment of the project reach after the project is funded. Target species for this project include summer steelhead (listed as ESA Threatened species), spring chinook (listed as ESA Endangered species), bull trout (listed as ESA Threatened species) and redband trout (a state sensitive species).

Limiting factors to be addressed along Whiskey Creek include: unstable streambanks in excess of normal, poor instream habitat conditions, poor riparian vegetation and high summer water temperatures. We propose to address these limiting factors by constructing riparian exclosure fencing to exclude livestock from the riparian area. Target species for this project include summer steelhead (listed as ESA Threatened species) and spring chinook (listed as ESA Endangered species).

Limiting factors along Hurricane Creek include: unstable streambanks in excess of normal, poor instream habitat conditions, poor riparian vegetation, high summer water temperatures, low summer flows, sediment load, water withdrawals and inadequate passage. This project reach lies within critical spring chinook spawning habitat. We propose to address these limiting factors by constructing riparian exclosure fencing to exclude livestock from the riparian area, planting native vegetation where necessary, and installation of site specific instream structures. A preliminary assessment of the project reach has been made. The actual need and proposed installation of riparian plantings will be determined by a more thorough assessment of the project reach after the project is funded. Target species of this project include spring chinook, summer steelhead and redband trout.

Limiting factors along Meadow Creek include: unstable streambanks in excess of normal, poor instream habitat conditions, poor riparian vegetation, high summer water temperatures and low summer flows. This project reach lies within critical spring chinook spawning habitat. We propose to address these limiting factors by constructing riparian exclosure fencing to exclude livestock from the riparian area, planting native vegetation where necessary, and installation of site specific instream structures. Note that only a preliminary assessment of the project reach has been made. The actual need and proposed installation of riparian plantings will be determined by a more thorough assessment of the project reach. Target species of this project include summer steelhead (listed as ESA Threatened species), spring chinook (listed as ESA Endangered species), and redband trout (a state sensitive species).

Each of the above listed projects lie within identified spawning and rearing habitat for spring chinook and summer steelhead and address limiting factors of each species (CTUIR 1983; Huntington 1994; GRMWP 1994; Noll el al. 1988; Mobrand and Lestelle 1997; Wallowa County-Nez Perce Tribe 1993**).**

New Implementation (Pre-work and Onsite): In FY2000 and beyond we will continue working cooperatively with landowners to protect riparian and instream habitat on high priority streams. The method of selecting projects will follow the watershed principles of using coordinated efforts, protecting the best habitat (on private lands), and restoring habitats that have a high likelihood of success. This will be accomplished through 15 year lease or cooperative agreements that restrict human use (i.e. eliminates grazing, road construction, timber harvest, mining, burning, etc.). We expect to sign agreements with 2-6 landowners annually. Fish access to preferred habitat will be improved or modified by removing fish passage barriers where applicable). Control of livestock utilization within riparian areas will be done through: a) fencing up to 10 miles of stream/year to exclude grazing, b) developing off-site water sources to encourage livestock to focus their attention away from riparian areas, and c) construct instream structures if needed.

Operations and Maintenance: In order to protect program investments, inspections and maintenance will be completed at least once annually on the following: a) 99.4 miles of riparian exclosure fences that protect 57.1 miles of streams and 1,254 acres of riparian and instream

habitat; 135 livestock water gaps; and 33 off-site spring developments; b) revegetate areas with native species where necessary to aid in bank stabilization and improve understory and overstory components of riparian plant communities. Degraded riparian areas will be restored as needed by planting native shrubs and trees or seeding with grasses and legumes, c) control noxious weeds in coordination with county weed agencies, d) inspect and maintain 2100 instream structures (***Note:*** *It may be determined that some instream structures should not be maintained if they not are achieving desired results).* Streambank stability and instream habitat diversity structures will be maintained on a case by case basis: using bioengineering techniques to stabilize streambanks and provide stream channel/grade control; installing large wood and/or boulders in stream channels to increase habitat diversity and number of pools; installing other site-specific instream structures needed to address factors limiting salmonid production or floodplain function; e) coordinate frequently with individual landowners and other stakeholders. Additional maintenance may occur following catastrophic natural events (e.g. floods, wind storms, ice flows etc.).

Monitoring and Evaluation: There are several ways in which individual projects are being monitored and data evaluated in order to determine if project goals and objectives are being met. The Grande Ronde Fish Habitat Enhancement Project has been monitoring the following:

- Stream Temperatures: Twelve permanent thermographs have been installed at the upper and lower ends of 6 project streams to measure long term changes in stream temperatures that may result from changes in habitat. These thermographs record water, and in some cases air temperatures on an hourly basis, 24 hours/day, year around. Other thermographs have been deployed in specific stream reaches to record summer temperatures only. This data identifies areas and the times of year when extreme temperatures (summer or winter) may limit salmonid production.

- Habitat Monitoring Transects: These transect studies measure specific physical and biological characteristics (i.e. channel substrate, channel width, bank height, flow features, ground cover type, stream shading, etc.) in selected study areas. They are designed to measure long term changes in the riparian vegetation and stream channel morphology, and help determine expected rates of recovery on other streams. One hundred forty habitat monitoring transects on four streams have been established within the project area. Following establishment of these transects and the initial data collection, measurements have been retaken at 3 to 5 year intervals.

- Photopoints: Due to the size and complexity of the program, the easiest and least costly way to monitor results from individual projects is through photographic documentation. The purpose of these photographs is to show changes in riparian vegetation (such as increased canopy and shading, improved bank stability, etc.), and changes in stream channel morphology (such as narrowing and deepening of the channel). Several photopoints are established on each individual project prior to implementation. Pictures are then retaken from most of these sites on an annual basis. In the Grande Ronde Basin two hundred and seventeen (217) photopoints have been established on 30 individual projects. "Before/After" photographs and slides are used for presentations and as educational tools, and they are provided to the respective landowners to demonstrate project benefits that have occurred over the years. They also help identify success or failure of specific instream structures or plantings.

- Other Biological Surveys: On selected streams--salmon or steelhead spawning ground

counts, inventories of nesting birds, fish population estimates, and measurements of growth rates of woody species have been collected. The data collected helps verify whether improvements in habitat result in corresponding increases in fish and wildlife populations.

Information gathered from monitoring tests our underlying assumptions and leads to the application of adaptive management on existing or future projects (See also Section 7d, Adaptive Management). The results of monitoring efforts have been included in quarterly, annual and other special reports, and are shared with other agencies or interested parties. In addition, other information frequently used by this program includes: tracking spawning ground counts conducted by other ODFW staff throughout the basin; physical stream habitat surveys that help identify limiting factors; use of BPA aerial photographs; and the results of research information on salmonid life histories produced by other projects. This information is available from respective ODFW fish districts, research groups, and other agencies or programs.

Coordination/Education: A watershed approach with broad-based communication and support from the community is essential to overall and long term project success.

Administration: Activities must be coordinated at various levels to insure program consistency. Routine tasks such as maintaining records, supervising personnel, purchasing supplies, writing reports, contract administration, and obtaining cost share funding are all necessary components of a watershed approach.

Expected Results: This project ensures that streams and associated native plant communities are allowed to evolve through natural stages of succession. Important riparian plant communities such as cottonwood and aspen groves are protected from harvest or other human related damage. In general, near term changes (1-5 years) in the affected streams include: increases in sedges, grasses, forbs and shrubs; narrowing and deepening of the stream channel; and improved overall habitat diversity. Long term changes (> 5 years) include: increased shading from development of overstory; reduced summer temperatures; increased summer flows; reduced sedimentation and bank erosion; increased instream and riparian habitat diversity; and reduced winter icing. Eventually, this will lead to a climax plant communities characterized by an overstory of deciduous hardwood and/or conifer species, accompanied with a functional mid and understory plant/shrub community. Increases in large woody debris input and associated pool habitat will occur naturally as late succession plant communities develop.

Improvement of the quality and quantity of spawning and rearing habitat for spring/summer chinook, summer steelhead and resident fishes such as bull trout and redband trout will result from this passive regeneration approach (NMFS 1997), and increases in natural production should occur. We believe this project will also provide multiple wildlife benefits as well, since approximately 75-80% of all wildlife species utilize riparian habitats for at least some portion of their life cycle. There are many benefits to participating landowners as well (i.e. reduced soil loss, improved water quality, better pasture management), and feedback from landowners on existing projects indicate that the majority have recognized the improvements and are willing to continue maintenance beyond the terms of the leases.

Factors that may limit success of this project include catastrophic natural events (i.e. floods, fires), changes in upslope management practices or changes in land use laws, and continued mainstem passage problems. However, regardless of the outcome of targeted ESA species, we expect that project outcomes will be generally beneficial to all other stream and riparian

dependent native species.

g. Facilities and equipment

With the exception of a few capital items that are purchased annually, this project has been fully equipped and operational for many years. Grande Ronde Fish Habitat Enhancement project personnel are currently stationed at the ODFW Northeast Region Office in La Grande, Oregon. Facilities include an office and conference room, office equipment (phones, fax, copiers, desktop and laptop computers, Internet access, slide projector, video, etc.), and spacious storage areas (covered & uncovered) for materials and equipment. The NE Region Office also has wood and metal shops accessible to this project. Similar facilities are available at the ODFW Enterprise District Office when needed.

Three vehicles (pick-ups) are leased by this project from the Oregon State motor pool. Vehicles or heavy equipment owned by this BPA/Fish Habitat project includes: a 4-wheel drive tractor equipped with a front end loader, backhoe attachment and post driver; two utility trailers; one ATV trailer; two 6-wheel drive and two 2-wheel drive ATV's. Other vehicles or equipment such as dump trucks, backhoes, and forklifts are available from the ODFW Region on relatively short notice.

Field equipment owned field by this BPA/Fish Habitat project includes: specialized fence construction tools (wire stretchers, spoolers, chainsaws, etc.); instream work tools (rock drills, hydraulic cable cutters); planting augers; pick-up racks and tool boxes; cameras; survey equipment (autolevel, rod, tapes, compasses, vests); and ten permanent thermographs.

h. Budget

Personnel

This project has been criticized recently for the high costs associated with operations and maintenance. It should be clearly understood by the reviewers that the current format of the project was a requirement by BPA when the project was established. It was believed at the time that securing 15 year lease agreements controlling management activities within the riparian corridor and by providing most of the maintenance support of the improvements installed would be the most effective means of achieving improvements to fish habitat. This project currently holds 30 lease agreements of which ODFW, with BPA funding, will be responsible for most project maintenance. Failure to meet the obligations of these lease agreements would result in alienation of landowners that would quickly be communicated throughout the region. ODFW believes that it has an obligation to fulfill the terms of the lease agreements until they expire. Not only do we believe we have this obligation, but after developing projects with 93 landowners in northeastern Oregon we believe that the project format as originally developed has been effective.

As the program matures landowners have observed the benefits of the completed projects, have become more responsive toward developing cooperative projects, and have shown greater interest in taking on the maintenance responsibilities of the project. Cooperation is the key to making significant habitat improvements on private lands. We are making constant progress in gaining increased landowner buy-in to our projects.

As a program we have observed many projects that have turned all the maintenance responsibilities to the landowner severely fail. Generally landowners enter into such a

maintenance agreement with good intentions. However, the landowners highest priority is to make a living. When choices have to be made the landowners operations take priority over that of the habitat project. A frequent result is that the habitat project (fences in particular) are not adequately maintained and the project fails. ODFW's top priority is improvement of fish habitat. We feel that the methodology of implementing we projects that we have used has been effective as cooperation gains momentum. We are now getting more commitment from landowners to do project maintenance. We will continue to seek increased commitment from landowners at a level "the market will bear".

We commend project implementers who develop successful projects in which all maintenance is handled by the landowner. However, with the clientele in the geographic areas that we work, such a situation is the exception rather than the rule. In order to make significant habitat improvements that lead to increased production we need to treat relatively large portions of habitat.

We have investigated other ways of maintaining and implementing projects and find the current staffing the most effective. We have tried subcontracting fence maintenance and found it to be an ineffective method. We currently have project staff build short reaches of fence because we can do them for a better cost, but we contract out most fence construction because on a larger scale contractors can do the job for less considering that we would have to hire more staff to complete all project tasks.

We have refined designs of riparian exclosure fence over the past thirteen years and have a good understanding of how to fit different designs/styles into the most appropriate situations (geography, substrate, livestock characteristics, wildlife usage and landowner needs). High-tensile smooth wire fence is the style most commonly used, but barbed wire is also used in certain situations.

Fringe Benefits

Same as FY1999.

Supplies, materials, non-expendable property

Supplies include material for five miles of high tensile smooth wire fence and the installation of two solar powered off-site watering to reduce costs associated with maintaining stream watering sites for livestock. Other costs are associated with maintaining existing fences and office equipment/supplies. There is no charge for office space.

Operations and maintenance

See discussion above

Travel

The project encompasses a large geographic area, Oregon portion of the Grande Ronde Subbasin. We believe it more cost effective to operate from one central location than to hire more personnel and develop an additional office in other parts of the subbasin.

Indirect Cost

The indirect rate increased in 1998 from 22.9 to 35.5. The rate increase reflects increased costs to administer the departments programs.

Subcontracts

Subcontract costs include construction of riparian fence and weed control. These cost estimates are based on thirteen years of implementing such work.

Section 9. Key personnel

SUMMARY OF KEY PERSONNEL:

NAME	TITLE	FTE/Hours	PROGRAM EXPERIENCE
Timothy D. Bailey	Acting Project Leader	2 months	11 years
Vance R. McGowan	Fisheries Habitat Biologist	Permanent, Full time	9 years
Russell M. Powell	Fish Habitat Technician	Permanent, Full time	6.5 years
Scott P. Stennfeld	Experimental Biology Aid	Seasonal, 10 months	6.5 years
Dirk W. Weaver	Experimental Biology Aid	Seasonal, 4 months	3 years
	Other EBA's (1-3)	Seasonal, 10-14 months	

Timothy D. Bailey
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Pendleton, Oregon 97801
home (541) 278-1949
work (541) 276-2344

EDUCATION Bachelor of Science in Fisheries Science, 1986
Oregon State University, Corvallis, Oregon

PROFESSIONAL EXPERIENCE

July 1998 to Present **Acting Fish Habitat Program Leader**
Oregon Department of Fish & Wildlife, Pendleton, Oregon, 97801

Oversee the implementation of FWP funded anadromous fish habitat improvement projects in northeastern Oregon including the John Day, Grande Ronde and Umatilla subbasins. Also oversee FWP funded ODFW involvement in the Umatilla Fish Passage Operations Project. Specific duties include: tracking project expenditures; developing FWP project funding proposals; developing annual budgets and work statements; reviewing/approving proposed projects and landowner agreements; liaison with BPA COTR's; providing direction on overall program activities; and supervising four biologists, three technicians and three to seven seasonal employees. In addition, continue to accomplish some fish district activities as described below.

1993 to 1998 **District Fish Biologist**
Oregon Department of Fish & Wildlife, Pendleton, Oregon, 97801

District Fish Biologist for the Umatilla Fish District. Responsible for the management of fish resources in the Umatilla, Walla Walla (Oregon portion) and Willow Creek basins. Specific duties included: planning, implementing, and analysis of the inventory and census of fish populations and their habitats in standing and flowing waters; setting angling regulations to maximize recreational fisheries and conservation of wild fish populations; reviewing land use activities such as logging activities, water usage, stream alterations, pollution discharges into waterways and provide comments to the regulating agencies; develop and implement hatchery programs to bolster harvest opportunities and supplement natural production; develop various basin and waterbody fisheries management plans; review and comment on activities that occur on public lands (USFS, BLM, etc.); make presentations to the public and constituent groups regarding fish management activities; manage fisheries resources cooperatively with tribal co-managers; prepare reports on district activities; oversee/coordinate with programs operating in the district such as fish habitat improvement, passage operations, etc.; coordinate/educate local interests such as SWCD's, watershed councils and user groups on department/district activities; develop plans for and oversee the protection and enhancement of fish habitat; and provide supervision of two biologists.

1989 to 1993 **Fish Habitat Biologist**
Oregon Department of Fish & Wildlife, Pendleton, Oregon 97801

Project Leader for the Umatilla Basin Fish Habitat Enhancement Project. Management responsibilities included implementation, monitoring, and maintenance of individual fish habitat projects on private lands in Umatilla Basin streams. Specific duties included: working with private landowners to develop and implement fish habitat projects in

anadromous fish bearing streams; conducting stream habitat inventories; preparing riparian easements or leases and construction contracts for fish habitat projects; develop biological and physical monitoring and evaluation plans; provide program oversight and direction for collection, analysis and interpretation of data; inspect and assess project maintenance needs; provide technical assistance, make presentations and coordinate with various public agencies, private landowners and tribal agencies; prepare reports on program activities; develop and track program budgeting; and provide supervision of one permanent technician and one to two seasonal personnel.

1988 to 1989 **Fish Habitat Technician 2**
Oregon Department of Fish & Wildlife, La Grande and Pendleton, Oregon

Responsibilities as Fish Habitat Technician 2 were to implement, monitor, and evaluate fish habitat projects in the Grande Ronde and Umatilla river basins. Typical duties included: supervise and conduct the design and layout of instream fish habitat work and riparian fences; conduct biological and physical monitoring of fish habitat projects such as fish population surveys, stream habitat surveys, taking photopoints, collecting riparian and stream habitat transect data, monitor stream temperatures using thermographs; maintaining fish habitat instream structures and riparian fences; preparing reports, data summaries and tracking program expenditures; purchase and maintain equipment and supplies; and supervise one to two seasonal employees.

1986 to 1988 **Experimental Biology Aid**
Oregon Department of Fish & Wildlife, Various positions in LaGrande and Florence

Conducted spawning ground surveys of fall chinook and coho salmon on the central Oregon Coast for two seasons. Identified and counted chinook and coho salmon, collected scale samples from carcasses, measured carcasses and counted redds. Recorded and compiled data.
Worked in La Grande for the Grande Ronde Basin Anadromous Fish Habitat Enhancement Project for two summers. Completed fish habitat stream inventories and summarized data. Assisted with the construction of instream fish habitat structures. Supervises a crew constructing instream structures. Develop project maps from aerial photographs. Repaired and maintained vehicles and equipment.
Worked for the Lower Snake River Compensation Plan Monitoring and Evaluation Project in La Grande. Conducted summer steelhead creel census on the Wallowa and Imnaha rivers and assisted with pre-release sampling of juvenile spring chinook and summer steelhead. Entered spawning and liberation data onto computer files.

1986 **Fisheries Technician**
Parametrix, Inc., Bellevue, WA

Operated hydroacoustic sonar equipment used to monitor downstream smolt passage at Snake River hydroelectric dams. Duties included identifying fish traces on chart recorders, gathering and recording flow data, entering data into microcomputers, and deployment of hydroacoustic equipment.

SKILLS/INTERESTS:

Trained in hazmat response and natural resource damage assessment. Specialized training in fish habitat enhancement techniques and bioengineering. Interests include family, bowhunting with traditional equipment, angling and general outdoor recreation.

Vance R. McGowan
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home (503) 963-9008
work (503) 963-2138

EDUCATION Bachelor of Science in Fisheries, 1980
Humboldt State University, Arcata, CA 95521

PROFESSIONAL EXPERIENCE

1993 to 1998 Fisheries Habitat Biologist, Grande Ronde Basin
Oregon Department of Fish and Wildlife, La Grande, OR 97850

Project Leader for the Grande Ronde Basin Fish Habitat Enhancement Project. Management responsibilities include implementation, monitoring, and maintenance of 30 individual fish habitat projects on private lands in Grande Ronde Basin streams. Specific duties include: working with private landowners to develop and implement fish habitat projects in anadromous fish bearing streams; conducting stream habitat inventories; preparing riparian easements or leases and construction contracts for fish habitat projects; develop biological and physical monitoring and evaluation plans; provide program oversight and direction for collection, analysis and interpretation of data; inspect and assess project maintenance needs; provide technical assistance, make presentations and coordinate with various public agencies, private landowners and tribal agencies; prepare reports on program activities; develop and track program budgeting; and provide supervision of one permanent technician and two to five seasonal personnel.

1990 to 1993 Fish Habitat Technician 2
Oregon Department of Fish and Wildlife, Enterprise, OR 97828

Responsibilities as Fish Habitat Technician 2 were to implement, monitor, and evaluate fish habitat projects in the Grande Ronde River basin. Typical duties included: supervise and conduct the design and layout of instream fish habitat work and riparian fences; conduct biological and physical monitoring of fish habitat projects such as fish population surveys, stream habitat surveys, taking photopoints, collecting riparian and stream habitat transect data, monitor stream temperatures using thermographs; maintaining fish habitat instream structures and riparian fences; preparing reports, data summaries and tracking program expenditures; purchase and maintain equipment and supplies; and supervise one to three seasonal employees.

1986 to 1990 Saltwater Facilities Assistant Manager
Anadromous Inc., Coos Bay, OR 97459

The Coos Bay Saltwater facility had multiple functions including ocean ranching of coho and chinook salmon, raising and harvesting “pansize” coho salmon, and net pen rearing of adult chinook and Atlantic salmon. Duties included: hiring, training, and supervising 8 permanent and 10-40 part-time employees; scheduling and coordinating program activities such as fish

transports, harvests, brood selection, fish grading, releasing smolts, fish processing, and programming the growth of pansize coho in order to continually harvest 10,000 lbs/week; maintaining records of these activities; Other responsibilities included supervising barge releases of tagged smolts, spawning of Atlantic salmon in sea water, keeping records of marine mammal problems, ordering equipment and supplies, preparing budget reports, safety committee member. I became acting site manager in July 1989 -- Additional responsibilities included completing monthly reports such as inventory reports, releases, trap and harvests and submitting these to appropriate agencies (ODFW, NMFS), and supervision of facilities maintenance and security personnel.

1982 to 1986 **Fish Culturist**
Anadromous Inc., Ft. Klamath, OR 97626

Routine duties consisted of spawning of broodstock, incubation of eggs, loading fish onto transport trucks, feeding fish, building and installing screens, inventorying fish and eggs, vaccinating salmon smolts against Vibrio sp., water quality tests, and various underwater jobs requiring SCUBA. I was responsible for running the coded wire tagging program, supervised grading operations, and keeping accurate records of these projects.

1980 to 1982 **Fish and Wildlife Aid**
California Dept. of Fish and Game, Red Bluff, CA 96080

Field work included: salmon spawning surveys; building and installing fyke traps, seining, and tagging fish to determine outmigration patterns of various fish species; boat, raft, and backpack electrofishing to obtain population estimates of resident fishes; taking scale samples of fish for age and growth analysis; creel census; collecting stomach samples of salmonids, squawfish, and suckers; equipment maintenance and repair. Research and laboratory work involved: calculating growth rates; determining population estimates; reading scales of brown and rainbow trout, steelhead, and suckers; analyze stomach samples, determine fecundity of fish; mapping spawning areas, and report writing.

1979 **Hatchery Volunteer Aid**
Humboldt State University, Arcata, CA 95521

The hatchery program at Humboldt State University was designed to give students the opportunity to learn the basics of salmonid culture. Work involved feeding fish, weigh samples, tagging and fin clipping fish for experiments, broodstock spawning, egg inventories, and pond cleaning. All work was voluntary, on a part-time basis, while attending school.

SKILLS/INTERESTS:

Certified SCUBA diver, CPR and First Aid, Member American Fisheries Society

RUSS M. POWELL
551 West Bryan Street
Union, Oregon 97883
(541) 562-6287

EDUCATION: Bachelor of Science Degree in Biology, 1991.
Western Oregon University, Monmouth, OR

PROFESSIONAL EXPERIENCE:

2/94 to 1/98 **Fish Habitat Technician 2**, *Oregon Dept. of Fish & Wildlife, La Grande, OR*

Duties: Assist the biologist with aspects of project administration by: organizing and supervising seasonal employees; purchasing field equipment and supplies and completing proper documentation; determining materials needed for projects; and assisting with report writing and budgeting aspects. Implement new projects by: assisting with design, layout and construction of new fences, watergaps and instream work projects; inspecting the work of contractors; and conduct plantings of native species within riparian areas. Assist with project monitoring by: taking photopoint pictures; thermograph maintenance, deployment and data summarization & graphing; collecting habitat transect data; and conducting spawning surveys of summer Steelhead. Maintain project areas and equipment by: inspecting and repairing fences, watergaps, and spring developments; maintaining vehicles and equipment; communicating with landowners frequently to continue ODFW/landowner rapport.

12/93 to 2/94 **Experimental Biology Aide**, *Oregon Dept. of Fish & Wildlife, Portland, OR*

Duties: Ran a permanent hunter check station at Sauvie Island. Checked goose hunters' harvest by recording species, subspecies, sex, and age. Wrote up any game violations and reported such violations to the Oregon State Police for follow-up.

9/93 to 12/93 **Wildlife Technician 1**, *Oregon Dept. of Fish and Wildlife, Heppner, OR*

Duties: Worked independently checking hunters in regulated hunt areas during deer and elk seasons. Flew over the Lower John Day area in a helicopter to conduct fall Big Horn Sheep and Mule Deer counts. I also built a number of guzzler roofs to be installed during winter or spring.

7/93 to 9/93 **Wildlife Technician 1,** *Or. Dept. of Fish & Wildlife, Hines/John Day, OR* 2/93 to 7/93
3/92 to 7/92

Duties: Tracked and observed radio-collared Big Horn Sheep in their natural habitat. Prepared reports concerning habitat preferences, territorial patterns, elevation, migratory patterns, and population trends of selected animals. Organized, compiled and input reference library of Sage Grouse literature into computer data base. Participated in capture and transport of 52 Big Horn Sheep for transplanting. Analyzed and input medical records for transplanted animals. Obtained stool samples from specific animals for analysis and/or detection of disease. Performed routine maintenance tasks in/around buildings and compound.

10/92 to 1/93 **Biological Aide**, *ODFW, Tillamook/Corvallis/Seaside, OR*
7/92 to 10/92

Duties: Conducted salmon spawning surveys on 36 streams. Collected data

2/92 to 3/92 and scale samples of captured adults. Data was collected at 10-day intervals
10/91 to 2/92 in order to determine peak migratory periods of wild and hatchery fish.

Collected aquatic inventory data on selected streams (width, depth, slope, shade, bank stability, etc.). Conducted electroshocking surveys at various locations to observe the number and distribution of fishes. Prepared survey reports and input information on computer. Contacted landowners, explained procedures and obtained permission to enter land.

6/91 to 10/91 **Fish & Wildlife Technician 1,** *ODFW , John Day, OR*

Duties: Constructed and maintained 80 miles of barbed and smooth-wire fence. Surveyed lines so contractors could begin construction of fences. Worked with individual landowners concerning construction specifications and location of projects. Worked with contractors on construction of fish weirs and in-stream rock work.

6/89 to 9/89 **Laborer 1,** *Oregon Dept. of Fish and Wildlife, Pendleton, Oregon*

Duties: Constructed and maintained various types of fences. Fences were constructed to regulate cattle use, define management area boundaries and protect tree seedlings from damage from winter elk and deer herds. Inspected sites to locate noxious plants and sprayed them with gas-powered sprayer towed behind a pick-up truck. Collected pine cones to obtain seeds for planting in areas to increase elk thermal and hiding cover.

3/89 to 6/89 **Internship,** *Hatfield Marine Science Ctr, Newport, OR*

Duties: Taught classes on: marine mammals showing how species adapt and survive through evolution and natural selection; fish anatomy and physiology and showing functions of organs in relation to its natural habitat, and how to determine the age of fish through analysis of scales and otoliths; showed several types of parasites living among fish. Supervised groups and individuals on field trips to tide pools on the Oregon coast.

Scott Paul Stennfeld
201 N Avenue
La Grande, OR 97850
(503) 963-6664

EDUCATION: Eastern Oregon State University
La Grande, OR 97850
Bachelor of Science Degree in Liberal Studies, 1995.

PROFESSIONAL EXPERIENCE:

3/97 to 1/98 and 7/96 to 12/96 — **Experimental Biological Aide**, Oregon Department of Fish and Wildlife **N**.E. Region, La Grande, OR. Responsibilities included implementing fish habitat projects, maintaining existing projects and equipment by performing or arranging maintenance on field equipment, planting riparian project areas and performing fence and watergap construction/maintenance on project leases. Monitoring fish habitat projects by collecting habitat transect data and conducting inventories of fish, birds, vegetation and other aquatic organisms.

6/95 to 8/95 — **Experimental Biological Aide**, Oregon department of Fish and Wildlife Research and Development, La Grande, OR. Primary duties were to conduct distribution and abundance electro-shocking surveys for residual summer steelhead and to snorkel select streams identifying and classifying summer habitat usage by juvenile summer chinook salmon.

12/94 to 3/95 — **Experimental Biological Aide**, Oregon Department of Fish and Wildlife Research and Development, La Grande, OR. Responsible for operating and maintaining 3 rotary fish traps being used to study the early life history of summer chinook salmon. Captured juvenile chinook salmon and juvenile summer steelhead were sampled according to project protocols.

6/94 to 12/94 — **Fisheries Technician / Biological Aide**, 50% of time worked for the Confederated Tribes of the Umatilla Indian Reservation and 50% with the Oregon Department of Fish and Wildlife Research and Development organizations, La Grande, OR. Responsibilities included operating and maintaining 3 rotary screw traps, gathering biological data on spring chinook salmon and summer steelhead juveniles, performing various habitat inventories, distribution & abundance surveys of residual summer steelhead and spring chinook spawning ground surveys. Assisted biologists with spawning adult salmon in hatchery.

2/94 - 6/94 and 7/93 - 11/97 — **Experimental Biological Aide**, Oregon Department of Fish and Wildlife Research and Development, La Grande, OR. Responsible for installing, operating and maintaining two rotary screw traps involved in a study focusing on the early life history of spring chinook salmon. Other primary responsibilities included “pit” tagging juvenile spring chinook salmon, electro-shocking for residual summer steelhead and snorkeling

assigned stream reaches for abundance and distribution of residual summer steelhead and spring chinook salmon juveniles.

5/93 - 7/93 **Fisheries Technician**, Pacific Northwest Research Station, Corvallis, OR. My duties were to track adult returning spring chinook salmon using radio telemetry within the Grande Ronde and Imnaha River basins. Using aerial and ground tracking, salmon were tracked and mapped to spawning grounds where micro-habitat typing of holding areas was performed using snorkeling techniques..

7/92 - 10/92 **Experimental Biological Aide,** Oregon Department of Fish and Wildlife Enterprise, OR. Responsible for aquatic habitat inventories, distribution & abundance surveys of bull trout in selected stream reaches, spring chinook salmon spawning ground surveys, species composition and distribution within irrigation canals and collecting of Red-band trout for genetic analysis.

7/90 - 5/91 **Experimental Biological Aide,** Oregon Department of Fish and Wildlife Research and Development, La Grande, OR. My primary duties were to perform aquatic stream inventories on assigned stream reaches, conduct summer steelhead angling creel census and assist biologist with different types of biological sampling involving juvenile and adult salmonids.

6/89 - 11/89, 6/88 - 12/88, 6/87 - 12/87 **Fisheries Technician**, Wallowa-Whitman National Forest, La Grande Ranger District, La Grande, OR. Responsible for implementing a multi-year instream fish habitat project located in the summer chinook salmon spawning areas of the Grande Ronde River. Duties included overseeing two riparian rehabilitation projects, completing steam habitat inventories and fire fighting.

Section 10. Information/technology transfer

The success of this project depends upon forming cooperative agreements between private landowners and other entities. Interagency cooperation and education will continue to be a vital component of this project.

The closely tied Grande Ronde, John Day and Umatilla habitat enhancement projects regularly share information, new techniques, and exchange reports and other data. Quarterly, annual and other special reports are distributed to respective ODFW districts and to BPA. Special reports, documents and data summaries (such as stream temperatures, fish or habitat surveys) are distributed to large a number of individuals and agencies including private landowners, ODEQ, ODSL, USFS, BLM, Tribes, the Grande Ronde Model Watershed Program, and local watershed councils. Ongoing cooperation and technology transfer regularly occurs between these groups.

Efforts to educate private landowners and the public include:

- Signing is placed in visible locations at all projects, identifying them as a cooperative habitat

restoration efforts between agencies and private landowners.

- News articles specifically on this project are occasionally written in local newspapers.

- Photopoint pictures or slides illustrating benefits of these restoration projects are displayed to the public regularly, such as at county fair exhibits, local school groups, bird clubs, forestry associations, elected officials, and other groups.

- Watershed or riparian restoration workshops are regularly attended by project personnel. For example, project personnel atttended the "Bioengineering Workshop" sponsored by the Umatilla Fish Habitat Enhancement project, and many of these techniques later incorporated into on the ground projects.

Methods used in this project (i.e. fence specifications, lease or cooperative agreement text, techniques on placement of large wood, etc.) have been applied on closely related ODFW Fish Restoration & Enhancement projects to benefit resident fishes (redband trout and bulltrout). Our methodology has also been utilized by many other agencies or groups. For example, we are frequently asked to give demonstrations on planting techniques or use of stream thermographs. Finally, ODFW region and district offices display several project-related riparian restoration and fisheries brochures that are readily available to the public.

Congratulations!